

(21) Application No. 16851/72 (22) Filed 12 April 1972 (19)

(23) Complete Specification filed 11 April 1973

(44) Complete Specification published 28 Jan. 1976

(51) INT. CL.<sup>a</sup> A23C 3/02

(52) Index at acceptance

A2D 2E1 2M 3A4

(72) Inventors ALBERT WIJNAND SCHOENMAKERS  
and JAN VELDSTRA

## (54) DAIRY PRODUCTS

(71) We, UNILEVER LIMITED, a company organised under the laws of Great Britain, of Unilever House, Blackfriars, London, E.C.4, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The invention relates to the preparation of packaged aerated viscous pasteurized dairy products, such as quark (fresh uncured cheese), cottage cheese and yoghurt or mixtures.

15 In the field of dairy-technology it has been accepted that, without the use of costly processes, it is practically impossible to obtain packaged aerated viscous dairy products with adequate shelf-life and, at the same time, with acceptable consistency and flavour. An example of a suitable but costly process is pasteurization or sterilization of the ingredients followed by aseptic whipping and packaging. Such a process is costly both in equipment and in the special precautions that have to be taken to ensure aseptic whipping and packaging.

20 It has now been found, surprisingly, that aerated viscous dairy products can successfully be pasteurized after packaging. The packaged products have adequate shelf-life and acceptable consistency and flavour. By consistency is meant both the appearance and the feel in the mouth. It has been found that adequate products are achieved when the non-fat dry matter content of the aerated viscous dairy product is between 1% and 4% less than the non-fat dry matter content of the corresponding aerated viscous dairy product that has not been pasteurized and that has the same consistency.

25 A whipping aid is used; particularly preferably a protein-based whipping aid is used, such as partly hydrolyzed proteins. Suitable and preferred products include D 100 sold under this trade-name of A. E. Staley Manufacturing Company and believed to be

enzymatically hydrolyzed soy protein as described in UK Patent Specification 1,231,652 and Hyfoama DS, Hyfoama 66 and Hyfoama 68 sold under these trade-names by Lenderink N.V. Hyfoama DS is an alkaline hydrolyzed casein as described in German Patent Specification 972,090. Hyfoama 66 and Hyfoama 68 are enzymatically hydrolysed wheat gluten, Hyfoama 68 also containing a stabilizer. Hyfoama is a registered Trade Mark. Such a whipping aid is used as a whipped aqueous solution containing sugar, which is mixed with the dairy product to aerate it. The process and each step in the process can be continuous or batch.

Stabilizers, such as locust bean gum, guar gum, gelatin, pectin and alginate, can advantageously be used. Preferred products are products containing cream and products containing fruit for example distributed throughout the product or as a layer at the bottom. When fruit is present mixed throughout the product, advantageously the stabilizer is derived from the fruit.

The product can be packaged in any convenient manner, for instance in closed plastic beakers or tubs. Pasteurization should occur above 50°C and preferably between 60°C and 70°C.

The term "aerated" is, as is conventional, intended to cover the use of other suitable gases, such as nitrogen and carbon dioxide, as well as air. The percentage aeration, based on the volume of the unaerated product, will usually be less than 100% and preferably will be between 20% and 70%.

Percentages, other than of aeration, given in this specification are by weight.

## EXAMPLE I

*Production of low fat quark with fruit*

## 1. Formulation

|                                   |         |    |
|-----------------------------------|---------|----|
| Curd, dry matter 15—15, 5%        | 100 kg  | 90 |
| Solution of guar gum 60 g/6.86 kg | 10.5 kg |    |
| Cream, 37% fat, liquid            | 3.7 kg  |    |
| Hyfoama/sugar solution, whipped   | 9.4 kg  |    |
| Fruit preparation                 | 20 kg   |    |

2. *Formulation of Hyfoama/sugar solution*  
 Sugar 9 kg  
 Water 9 kg  
 Hyfoama 0.6 kg  
 5 Gelatin 0.3 kg
3. *Formulation of Fruit Preparation*  
 Sugar 49%  
 Fruit 50%  
 Stabilizer and Flavour 1%
- 10 4. *Preparation of Hyfoama/sugar solution*  
 0.3 kg gelatin was dry-mixed with 1kg sugar and sprinkled into 9 litres warm water (approx. 50°C) that was stirred until the gelatin and sugar had dissolved.  
 15 0.6 Hyfoama was dry-mixed with 8 kg sugar.  
 With slow stirring the mixture of Hyfoama and sugar was added to the warm gelatin solution. Then, with introduction of nitrogen, the cooled mixture was whipped until an overrun of 300% was obtained.
- 20 5. *Preparation of the final product*  
 25 (a) The curd was mixed with the guar gum solution and the cream. Then the whipped Hyfoama/sugar solution was added and mixed in.  
 30 (b) The mixture was then added to the fruit preparation already in plastic beakers. The beakers were sealed and placed in a hot-air chamber. The beakers were arranged so that an even air-distribution was obtained. The temperature of the air was not allowed to exceed 70°C. The residence time depended on the temperature. A residence time of at least 30 minutes was used when the temperature in the centre of the product was 61°C.  
 35 The final product had an overrun of 20—25% and a dry matter content of 19—20%.
- 40 **EXAMPLE II**  
*Production of fruit cottage cheese with 27% fat on dry matter*
- 45 1. *Formulation*  
 Curd, dry matter 16% 100 kg  
 Water 42 kg  
 50 Cream, 37% fat 28.5 kg  
 Sugar 10.2 kg  
 Locust bean gum 0.265 kg  
 Hyfoama 68 ex Lenderink & Co. 0.840 kg  
 Colouring 0.020 kg  
 55 Fruit 36 kg
2. *Method*  
 A Hyfoama solution was made consisting of:  
 0.840 kg Hyfoama  
 60 9.2 kg sugar  
 32.2 l water
- The Hyfoama was first dry-mixed with the sugar and then dissolved in the water that had been heated to at least 50°C. After thorough mixing the solution was cooled and then whipped.
- A locust bean gum solution was made consisting of:  
 0.265 kg locust bean gum  
 1.0 kg sugar  
 10 l water
- The locust bean gum was dry-mixed with the sugar and subsequently dissolved and thoroughly mixed in the water that had been heated to at least 70°C. The solution was allowed to cool to below 30°C.
- The curd and the locust bean gum solution were mixed and then the cream and the colouring were added. When the mass had been thoroughly mixed, the whipped Hyfoama solution was added with stirring. The product was packaged with the fruit and pasteurized as described in Example I under 5 (b).
- The overrun of the product was about 18% and the dry matter content about 21%.
- WHAT WE CLAIM IS:—**
1. A process for preparing a pasteurized packaged aerated viscous dairy product which comprises aerating a viscous dairy product by mixing said dairy product with a whipped aqueous solution of sugar containing a whipping aid, the non-fat dry matter content of the mixture being between 1% and 4% by weight less than the non-fat dry matter content of the corresponding aerated dairy product having the same consistency but which has not been pasteurized after aeration; packaging the aerated dairy product; and subsequently pasteurizing said packaged aerated dairy product.
2. A process as claimed in claim 1 in which the dairy product contains cream.
3. A process as claimed in claim 1 or claim 2 in which the dairy product contains a stabilizer.
4. A process as claimed in any one preceding claim, in which the dairy product contains fruit.
5. A process as claimed in any one preceding claim in which the dairy product is quark, cottage cheese or yoghurt.
6. A process as claimed in claim 5 in which the dairy product is quark.
7. A process as claimed in any one preceding claim in which the whipping aid is a protein-based whipping aid.
8. A process as claimed in claim 7 in which the protein-based whipping aid is a partly hydrolysed protein.

9. A process for preparing a packaged aerated viscous pasteurized dairy product substantially as described with particular reference to either of the examples.      cous dairy product prepared by a process as claimed in any one preceding claim.

5 10. A pasteurized packaged aerated vis-

DR. J. M. REID,  
Agent for the Applicants.

Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1976.  
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY  
from which copies may be obtained.